Differing HIV Risks and Prevention Needs among Men and Women Injection Drug Users (IDU) in the District of Columbia

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ABSTRACT *Washington, DC has among the highest HIV/AIDS rates in the US. Gender differences among injection drug users (IDUs) may be associated with adoption of prevention opportunities including needle exchange programs, HIV testing, psychosocial support, and prevention programming. National HIV Behavioral Surveillance data on current IDUs aged ≥18 were collected from 8/09 to 11/09 via respondent-driven sampling in Washington, DC. HIV status was assessed using oral OraQuick with Western Blot confirmation. Weighted estimates were derived using RDSAT. Stata was used to characterize the sample and differences between male and female IDU, using uni-, bi-, and multivariable methods. Factors associated with HIV risk differed between men and women. Men were more likely than women to have had a history of incarceration (86.6% vs. 66.8%, p<0.01). Women were more likely than men to have depressive symptoms (73.9% vs. 47.4%, p< 0.01), to have been physically or emotionally abused (66.1% vs. 16.1%, p<0.0001), to report childhood sexual abuse (42.7% vs. 4.7%, p<0.0001), and pressured or forced to have sex (62.8% vs. 4.0%, p<0.0001); each of these differences was significant in the multivariable analysis. Despite a decreasing HIV/AIDS epidemic among IDU, there remain significant gender differences with women experiencing multiple threats to psychosocial health, which may in turn affect HIV testing, access, care, and drug use. Diverging needs by gender are critical to consider when implementing HIV prevention strategies.*

KEYWORDS *HIV/AIDS, Behavioral surveillance, Gender, IDU, HIV/AIDS prevention*

BACKGROUND

Centers for Disease Control and Prevention (CDC) surveillance data reveal that at the end of 2008, 16,513 persons were living with a diagnosis of HIV infection in

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the District of Columbia (DC), making it one of the cities with the highest prevalence of HIV/AIDS cases in the US.[1] While the epidemic among injecting drug users (IDU) has slowed, there remains a concentrated epidemic of HIV among IDU; recent DC surveillance data reveal that 21.4% of all new AIDS cases are attributed to injection drug use, and it is the second leading cause of new AIDS cases among women.[1] In DC, half (47.5%) of all persons acquiring HIV through injection drug use are considered late testers, those who progress to AIDS within 12 months of their HIV diagnosis, and the largest proportion of deaths attributable to HIV was among IDU (30.7%).[1] Despite effective prevention methods available to IDU including needle exchange programs (NEP),[2–5] HIV among IDU does not appear to be moving towards elimination.

Previous literature suggests consistent differences between men and women IDU in behaviors as well as HIV-prevalence.[6–17] In DC, IDU, especially women IDU, are poorly characterized, contributing to difficulties in addressing their HIV prevention needs. For example, NEPs provide one of the most important methods of HIV prevention among IDU,[2–5] yet barriers to their utilization by women in DC have not yet been described in the literature. Locally, recent changes in the law allow for NEPs to be supported by federal funds,[18] providing a new opportunity in DC for HIV prevention when funds are available,[18–20] and organizations are operational.[21] Gender differences among IDU may affect access to other prevention opportunities as well, including HIV testing, and ancillary support such as mental health and domestic violence care. The paucity of information available surrounding experiences of women IDU with regard to HIV prevention strategies makes it difficult to predict how well these strategies can be implemented among them or remove barriers to their uptake. The purpose of this analysis was to assess the constellation of behavioral and psychosocial risk factors associated with gender among IDU to inform development of novel HIV prevention strategies.

METHODS

Data were obtained through the Centers for Disease Control and Prevention (CDC)-funded National HIV Behavioral Surveillance (NHBS) DC site. NHBS methods have been described elsewhere.[22–24] Briefly, cross-sectional behavioral and HIV testing data from men who have sex with men, IDU, and heterosexuals at increased risk of HIV infection are collected in repeated, annual community-based surveys. For NHBS-IDU-2, a sample of IDU was recruited between August and November 2009 via respondent-driven sampling (RDS), a chain-referral method which accesses hard to reach populations and provides estimates generalizable to the population of networks from which they are drawn; this method has been used in populations of IDU by other authors.[25–36] Non-randomly identified "seeds" are given coupons to recruit three people from their social and/or sexual networks to join the study, and each subsequent eligible person completing the interview is provided with up to three coupons with which to recruit their network members. Eligible individuals lived in the metropolitan DC area, were 18 years old and older, and injected drugs in the past 12 months based on verification of injection sites or successful completion of a knowledge screener specific to IDU. All subjects met eligibility criteria, had a coupon, completed the survey in English, and provided informed consent. Following administration of an anonymous, interviewer-administered questionnaire on sexual, drug use, and health care utilization behaviors, a rapid oral HIV screening test

(OraQuick Rapid 1/2 *ADVANCE®*, Bethlehem, PA) was conducted; those who screened positive or self-reported positive provided a sample of oral fluid for OraSure Western Blot confirmation of HIV status. Participants received $25.00 for the interview, $10.00 for the HIV screening, and $10.00 for each eligible participant referred. Subjects screening HIV-positive were immediately referred into care. All activities were overseen by the CDC, approved by DC Department of Health (DOH) and The George Washington University (GWU) Institutional Review Boards, and guided by the GWU HIV Research Community Advisory Board.

Analytic Methods. Provided that RDS assumptions are met,[27,29,30,37] RDS allows for a final sample independent from the seeds, and for calculation of sampling probabilities that provide population-based estimates of variables under study. Chi-square tests were used to compare demographic and behavioral characteristics between men and women. Variables that were significantly associated upon weighted bivariable analysis were tested for inclusion in the logistic regression models to describe HIV-related and psychosocial characteristics associated with gender. Demographic confounders remained if they were statistically significant or if addition or removal resulted in a change of ±5% in the estimates. All data reported were weighted for RDS using RDSAT, version 5.6.0 (Ithaca, NY). SAS version 9.1 (Cary, NC), and Stata 10.0se (College Station, TX) were used for analysis.

RESULTS

Overall Sample Characteristics

Of 553 participants, the majority was male (62.7%), over 50 years of age (57.9%), self-identified as heterosexual (94.3%), a high school graduate or less (76.6%), unemployed (52.8%), and had an annual income of under $10,000 (65.3%). Five were transgender and eliminated from the gender comparison due to small sample size. The majority of the sample (96.4%) identified as black. Most participants had health insurance (87.9%), and of those who did, most had Medicaid (83.2%). A large proportion of the population (49.1%) had ever been homeless, and 79.6% had ever been in prison, juvenile detention, or jail, with 22.6% having been arrested in the past year. Thirteen percent of the participants were confirmed HIV-positive, and 30.3% of those were unaware of their status.

Demographic Differences Associated with Gender

As shown in Table 1, of the 548 participants eligible for the gender comparison, men were significantly older than women ($p<0.01$), with the largest proportion of men found in the 51–60 year old group (52.6%), and the largest proportion of women in the 41–50 year old group (48.4%). Although nearly all study participants were black, men were more likely to be black than women (99.3% vs. 91.1%, $p<0.0001$). Women were more likely to report being bisexual or homosexual than men (12.7% vs. 1.2%, $p<0.0001$). Women were more likely than men to currently have health insurance (93.1% vs. 84.4%, $p<0.05$), yet among those who were insured, females were more likely than males to have Medicaid (92.7% vs. 76.0%, $p<0.001$; data not shown in table).

TABLE 1 Characteristics of male and female injection drug users ($N=548$)

	Male $n=342$ n (%)	Female $n=206$ n (%)	Adjusted behavioral factors associated with being female[a]
NHBS HIV screening test positive	13.1	12.7	1.75 (1.02–3.03)*
Ever tested for HIV	97.1	98.7	–
Demographic characteristics			
Age (years)**			
18–40	6.4	5.4	–
41–50	30.3	48.4	–
51–60	52.6	45.2	–
61+	10.6	1.0	–
Black race***	99.3	91.1	–
Sexual orientation***			
Heterosexual	98.7	87.3	–
Homosexual or bisexual	1.2	12.7	–
High school graduate or less	74.2	80.7	–
Unemployed	51.1	52.5	–
Homeless last 12 months***	15.2	10.5	0.83 (0.58–1.18)
Ever been to jail, prison, or juvenile detention**	86.6	66.8	0.40 (0.25–0.63)***
Psychosocial characteristics			
Depressive symptoms within the last week (CES-D ≥16)**	47.4	73.9	3.38 (2.20–5.20)***
Ever physically or emotionally abused***	16.1	66.1	4.50 (3.03–6.78)***
Ever pressured/forced to have sex***	4.0	62.8	0.72 (0.19–2.66)
Ever experienced child abuse***	4.7	42.7	5.94 (3.57–9.91)***
Characteristics of last sex partner			
Type of partner at last sex**			
Main	72.0	79.9	0.91 (0.48–1.71)
Casual	23.2	8.5	–
Exchange	4.8	11.6	–
Partner ever injected drugs***	39.1	87.4	5.11 (3.12–8.37)***
Drug use behaviors (not mutually exclusive)			
Injection drug use, last 12 months			
Heroin	99.6	99.2	–
Speedballs	51.5	50.1	–
Powdered Cocaine	31.4	26.6	–
Crack Cocaine	14.0	16.5	–
Non-injection drug use, last 12 months			1.16 (0.81–1.66)
Heroin	68.4	73.6	–
Crack Cocaine	70.0	72.4	–
Marijuana*	70.7	50.7	–
Pain Killers	37.8	50.4	–
Downers*	24.7	45.3	–
Powdered Cocaine	44.5	40.9	–
Ecstasy	13.4	9.1	–

TABLE 1   *(Continued)*

	Male $n=342$ n (%)	Female $n=206$ n (%)	Adjusted behavioral factors associated with being female[a]
Needle sharing behaviors			
Shared needles with last injecting partner*	10.7	26.6	1.91 (1.02–3.59)*
Last shared needles with sex partner*	9.7	25.5	2.39 (1.35–4.23)**

Although transgender individuals are allowed in NHBS-IDU, not all behavioral information is collected for them and the very small sample size limits their analysis; thus for the purpose of this analysis, they were excluded. All bivariable estimates are adjusted using RDSAT. OR and 95% CI are unweighted, given no significant differences being found on comparison of weighted and unweighted bivariable proportions

*$p<0.05$; **$p<0.01$; ***$p<0.001$

[a]Factors associated with being female after adjustment for age, race, incarceration history, employment status, and condom use at last sex except for evaluation of incarceration as an outcome, which is adjusted for age, race, employment status, and condom use at last sex

HIV and Risk Factor Differences Associated with Gender

Factors associated with HIV risk differed between men and women. Men were more likely to be currently homeless compared to women (42.7% vs. 23.1%, $p<0.001$) and more likely to have had a history of incarceration (86.6% vs. 66.8%, $p<0.01$), including being arrested and booked in the past 12 months (30.1% vs. 10.2%, $p<0.001$; data not shown in table). Women were more likely than men to have depressive symptoms defined by a Center for Epidemiologic Studies Depression Scale (CES-D) score ≥ 16 (73.9% vs. 47.4%, $p<0.01$), and to have ever been physically or emotionally abused by someone close to them (66.1% vs. 16.1%, $p<0.0001$). Women were also more likely to report having experienced childhood sexual abuse (42.7% vs. 4.7%, $p<0.0001$) and having been pressured or forced to have sex (62.8% vs. 4.0%, $p<0.0001$), although if they were abused, men were more likely than women to report that this occurred within the past 12 months (58.2% vs. 14.1%, $p<0.01$) (data not shown in table). Characteristics of sexual partners differed between men and women as well. Men were more likely than women to have a casual partner as their last sex partner (23.2% vs. 8.5%, $p<0.007$), where a higher proportion of women reported having an exchange partner at last sex (11.6% vs. 4.8%, $p<0.007$). Women were more likely to have a last sex partner who injected drugs, ever used crack, ever been in prison or jail for more than 24 h, and was older ($p<0.01$ for all variables). There were no unadjusted differences by gender with regard to HIV status or HIV testing behaviors.

As shown in Table 1, although heroin, cocaine, and speedball (combination of heroin and cocaine) use did not differ by gender, women were significantly more likely to report using injected oxycontin, downers, and other club drugs, such as ketamine, gamma-hydroxybutyric acid, and poppers (amyl nitrite). However, men were more likely than females to report using marijuana. Men were younger at their first injection and had a longer injection career than females [median years 18 (IQR 16–22) vs. median 21 (IQR 17–28), $p<0.0001$] (data not shown in table). In terms of needle acquisition, women were more likely than men to report getting their needles from a friend or partner (73.9% vs. 59.5%, $p<0.05$); women were less likely to utilize sterile needles or cookers, cotton, or water from a NEP than men,

although these differences were not statistically significant ($p<0.11$ and $p<0.08$, respectively) (data not shown in table). Women were significantly more likely to report needle sharing with the last injection compared to men (31.5% vs. 26.6%, $p<0.05$). In addition, a higher proportion of women reported that their last injection partner was also a sex partner (25.5% vs. 9.7%, $p<0.05$), while a higher proportion of men reported their last injection partner to be a friend or acquaintance (84.7% vs. 68.9%, $p<0.05$; data not shown in table).

Multivariable Associations with Gender

In multivariable logistic regression, women had significantly different risk factors and psychosocial lifetime experiences than men. As shown in Table 1, for confounders, being a woman was independently associated with being HIV-positive [adjusted odds ratio (AOR) 1.75 (95% CI 1.02–3.03)], reduced odds of having a history of incarceration [AOR 0.40 (95% CI 0.25–0.63)], depressive symptoms [AOR 3.38 (95% CI 2.20–5.20)], physical/emotional [AOR 4.50 (95% CI 3.03–6.78)], and sexual child abuse [AOR 5.94 (95% CI 3.57–9.91), having a last sex partner who injected drugs [AOR 5.11 (95% CI 3.12–8.37)] or used crack [AOR 1.77 (95% CI 1.11–2.83)], had a history of incarceration [AOR 5.78 (95% CI 3.50–9.54)], or was older than the participant [AOR 5.75 (95% CI 3.46–9.57)], sharing needles in the last 12 months [AOR 2.25 (95% CI 1.50–3.39)] and with last injecting partner [AOR 1.91 (95% CI 1.02–3.59)], and sharing needles at last injection with a sex partner [AOR 2.39 (95% CI 1.35–4.23)].

DISCUSSION

This study of IDU in the District of Columbia provides the first community-based estimate of behaviors among this population, with a focus on the key differences between men and women. In this study, we found women IDU were more likely to have depressive symptoms, be younger, and have experienced abuse than men IDU. Women had greater odds of having HIV-related risk factors including needle sharing and high-risk sex partners. After adjustment for confounders, women were more likely to be HIV-positive. The elevated prevalence of psychosocial correlates of HIV including depressive symptoms, having high-risk sexual partners, and needle sharing behaviors after adjustment for confounders, suggest that the constellation of factors affecting women IDU differ substantially from men.

Like other authors, we found that injection behaviors differ substantially by gender,[6–11,13–15,17,38–43] with women more likely to be injected by a sexual partner than friends or acquaintances, share needles, and use a greater variety of drugs than men. We found that men experienced HIV risk behaviors as well, with increased homelessness and incarceration relative to women, though these differences were attenuated after adjustment for confounders; indeed, the constellation of psychosocial issues including depression was greater among women than men, as other authors have found.[7,41,44–46] Other authors have noted differences in injection rituals, practices, and injection partner selection between men and women[7,10,14,15,17,39]; identification of needs that are fulfilled by such practices and that drive their selection, may inform development of innovative prevention approaches developed specifically for women. Our findings echo those of other authors, with some differences: in a convenience sample of younger IDU, Doherty et al.[15,16] found women had elevated risk of HIV and while they had similar patterns of injection initiation, women were no more likely to be injected by sex partners at injection

initiation. Evans et al.[17] found no significant differences between men and women with respect to education, race, housing, yet, as we also found, had increased odds of being injected by a sex partner relative to men. These findings suggest that—especially in view of overlapping epidemics among IDU and heterosexual populations[23,24]—identifying new ways to reach women and provide services to address overall as well as HIV prevention needs is a critical step in slowing the HIV epidemic in the District of Columbia.

There are several limitations to this study. As with most studies of sexual and drug use risk behaviors, the majority of information is obtained via self-report and participants may have had difficulty recalling information or may have under-reported socially undesirable behaviors. As an interviewer-administered question-naire, it is possible that there were inter- and/or intra-interviewer differences in the reading of questions or the recording of answers, although extensive training and ongoing quality assurance were performed to avoid these errors. Although there is a possibility that some non-IDUs enrolled in the study, participants were screened for physical signs of recent injection. RDS has been shown to be an effective recruitment strategy for hidden populations including IDU[47–51]; despite concerns that RDS could negatively impact data collection or interpretation of analysis, we found no untoward effect of RDS on the participants. Finally, cross-sectional studies are not able to demonstrate causality.

This study suggests that women IDU have diverging needs, risk factors, and behaviors from their male counterparts. Future studies are needed to develop improved prevention strategies for women IDU, even in the presence of a slowing IDU epidemic. The high prevalence of abuse, depressive symptoms, and needle sharing among women highlight the need for gender-specific prevention approaches to slow HIV among IDU; given the overlapping nature of the epidemics in DC, this has implications for the overall population as well as the IDU population. By focusing not only on HIV-related injection and sexual behaviors, this study adds to the dialogue regarding gender differences by characterizing differences with respect to other service needs and potential barriers to NEP uptake. Future studies to evaluate women IDU continue to be necessary to more fully expand on our knowledge of this population.

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